



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

09/942,724

08/31/2001

Tetsuya Ohshima

NITT.0032

8408

7590

11/14/2002

REED SMITH HAZEL & THOMAS LLP

Suite 1400

3110 Fairview Park Drive

Falls Church, VA 22042

EXAMINER

NGUYEN, MICHELLE P

ART UNIT

PAPER NUMBER

2851

DATE MAILED: 11/14/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n No.

09/942,724

Applicant(s)

OHSIMA ET AL.

Examiner

Michelle Nguyen

Art Unit

2851

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 4, 5, 8, 9 and 14-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4 recites the limitation "f denotes the focal length of the illumination lens" in lines 6-7. However, claim 1 from which claim 4 depends recites the limitation "a focus point f of the illumination lens" in lines 10-11, thereby rendering claim 4 indefinite.

Claim 5 recites the limitation "f denotes the focal length of the illumination lens" in lines 6-7. However, claim 1 from which claim 5 depends recites the limitation "a focus point f of the illumination lens" in lines 10-11, thereby rendering claim 5 indefinite.

Claim 8 recites the limitation "f denotes the focal length of the illumination lens" in lines 5-6. However, claim 1 from which claim 8 depends recites the limitation "a focus point f of the illumination lens" in lines 10-11, thereby rendering claim 8 indefinite.

Claim 9 recites the limitation "f denotes the focal length of the illumination lens" in line 5. However, claim 1 from which claim 5 depends recites the limitation "a focus point f of the illumination lens" in lines 10-11, thereby rendering claim 9 indefinite.

Claim 14 recites the limitation "f denotes the focal length of the illumination lens" in lines 6-7. However, claim 12 from which claim 14 depends recites the limitation "a

focus point f of the illumination lens" in lines 12-13, thereby rendering claim 14 indefinite.

Claim 15 recites the limitation " f denotes the focal length of the illumination lens" in lines 6-7. However, claim 12 from which claim 14 depends recites the limitation "a focus point f of the illumination lens" in lines 12-13, thereby rendering claim 15 indefinite.

Claim 16 recites the limitation " f denotes the focal length of the illumination lens" in line 5. However, claim 12 from which claim 14 depends recites the limitation "a focus point f of the illumination lens" in lines 12-13, thereby rendering claim 16 indefinite.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

4. Claims 1-3, 12 and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,314,210 to Fukushima et al.

With regard to claim 1, Fukushima et al. disclose a display comprising:

a projector including:

a light source (light source 111) extending at least one-dimensionally or two-dimensionally (see Fig. 3);

an illumination lens (collimator lens 13) through which a luminous flux emitted from the light source 111 passes (see Fig. 3);

a light valve (input image display device 22) for modulating the luminous flux passed through the collimator lens 13 (see Fig. 3); and

a projection lens (Fourier transform lens 31) for projecting the luminous flux modulated at the display device 22 (see Fig. 3); and

a screen (Fourier transform plane F2) for displaying a projected image projected by the Fourier transform lens 31 of the projector, the display device 22 of the projector being located roughly at a focus point f of the collimator lens 13 (see Fig. 3).

With regard to claim 2, Fukushima et al. show the light source 111 as discussed above with respect to claim 1 to be located roughly at the opposite focus point of the collimator lens 13 from the focus point at which the display device 22 is roughly located (see Fig. 3; Here examiner interprets the term "roughly" to mean without exactness-approximately.).

With regard to claim 3, Fukushima et al. show the display device 22 to be positioned at the focus point f of the collimator lens 13 with a deviation in the range of $\pm 25\%$ away from the collimator lens 13 (see Fig. 3).

With regard to claim 12, Lee discloses a stereoscopic display comprising:

a left and right pair of projectors each including:

a light source (light sources 111, 112) extending at least one-dimensionally or two-dimensionally (see Fig. 3);

an illumination lens (collimator lens 13) through which a luminous flux emitted from the light sources 111, 112 passes (see Fig. 3);

a light valve (display device 22) for modulating the luminous flux passed through the collimator lens 13 (see Fig. 3); and

a projection lens (Fourier transform lens 31) for projecting the luminous flux modulated at the display device (see Fig. 3); and

a screen (Fourier transform plane F2) for displaying respective projected images projected by the Fourier transform lens 31 of the pair of the projectors on the same panel, the display device 22 of each of the projectors being located roughly at a focus point f of the collimator lens 13 (see Fig. 3).

With regard to claim 13, Fukushima et al. show the display device 22 to be positioned at the focus point f of the collimator lens 13 with a deviation in the range of $\pm 25\%$ away from the collimator lens 13 (see Fig. 3).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 6, 10 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukushima et al. as applied to claims 1 and 2 above, and further in view of U.S. Patent No. 6,330,111 to Myers.

With regard claims 6 and 10, Fukushima et al. do not teach the light source 111 as discussed above with respect to claims 1 and 2 to comprise light-emitting diodes arranged in a one-dimensional or two-dimensional array. However, Myers teaches light-emitting diode arrays to have low power consumption relative to conventional lighting elements, the ability to emit light of different colors and durability (see Col. 1, lines 35-8). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use as the light source of Fukushima et al. a light-emitting diode array as taught by Myers.

With regard to claim 18, Myers teaches the light-emitting diodes constituting a light source as discussed above with respect to claim 10 to be arranged at least in two or more different directions in combination (see Fig. 2A).

7. Claims 7, 11 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukushima et al. as applied to claims 1, 2 and 12 above, respectively, and further in view of U.S. Patent No. 6,323,999 to Ueda et al.

With regard to claims 7, 11 and 17, Fukushima et al. do not teach the Fourier transform plane F2 as discussed above with respect to claims 1, 2 and 12, respectively, to be a screen for causing diffuse reflection of and performing display of the projected image. However, Ueda et al. disclose a display comprising a screen (screen 13) for displaying a projected image by an illumination lens (projection optical system 12L,

12R) of a projector, thereby rendering the display of Ueda et al. analogous to the display of Fukushima et al. (see Fig. 4). Ueda et al. teach the screen 13 to have a reflecting surface (see Col. 9, lines 12-3, Fig. 4). Further, Ueda et al. teach a diffusing plate 16 to be in contact with the reflecting surface of the screen 13 for further magnifying the image (see Col. 9, lines 12-3). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to replace the Fourier transform plane of Fukushima et al. with the screen of Ueda et al. for further magnifying the projected image.

8. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukushima et al. and Myers as applied to claims 10 and 18 above, respectively, and further in view of U.S. Patent No. 6,323,999 to Ueda et al.

With regard to claims 19 and 20, see discussion above with respect to claims 7, 11 and 17.

9. Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukushima et al., Myers and Ueda et al. as applied to claim 20 above, and further in view of U.S. Patent No. 4,329,019 to Okoshi et al.

With regard to claim 21, Ueda et al. teach the screen 13 as discussed above with respect to claim 20 to comprise an anisotropic diffusion mean (see Col. 9, lines 18-23, Fig. 5). Although Ueda et al. further teach the screen 13 to be retroreflective, Ueda et al. do not teach explicitly the screen 13 to comprise a corner reflector for causing the retroreflectivity of the screen 13. However, Okoshi et al. disclose a display comprising a retroreflective screen for causing diffuse reflection of and performing display of the

projected image, thereby rendering the screen the display of Okoshi et al. analogous to the screen of Ueda et al. (see Col. 3, lines 29-31). Okoshi et al. teach the screen to comprise a corner reflector for improving reflection selectivity (see Col. 2, lines 11-8, Col. 3, lines 20-52). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to replace the screen of Ueda et al. with the screen Okoshi et al. for improving display performance.

With regard to claim 22, Fukushima et al. teach the display as discussed above with respect to claim 21 to comprise a plurality of projectors (see Fig. 3). Further, Ueda et al. teach the display as discussed above with respect to claim 21 to comprise a plurality of projectors (see Fig. 4).

Allowable Subject Matter

10. Claims 4, 5, 8, 9 and 14-16 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

11. The following is a statement of reasons for the indication of allowable subject matter:

With regard to claims 4 and 14, the prior art does not disclose a display in the case where an area of a light source is large, and satisfying the expression $W > 1.2f / F_n$, where W is the diameter of a light source, f is the focal length of an illumination lens and F_n is the F-number of a projection lens as set forth in the claims.

With regard to claims 5 and 15, the prior art does not disclose a display in the case where an area of a light source is small, and satisfying the expression $W \leq 1.2f /$

F_n , where W is the diameter of a light source, f is the focal length of an illumination lens and F_n is the F-number of a projection lens as set forth in the claims.

With regard to claim 8, the prior art does not disclose a display in the case where the expression $\alpha_H \geq \arctan (dH / 2f)$ is satisfied, where dH is the horizontal width of a light valve, f is the focal length of an illumination lens and α_H is the angle of radiation in the horizontal direction at each point of a light source as set forth in the claim.

With regard to claims 9 and 16, the prior art does not disclose a display, wherein the expression $\alpha_V \geq \arctan (dV / 2f)$ is satisfied, where dV is the vertical width of a light valve, f is the focal length of an illumination lens and α_V is the angle of radiation in the vertical direction at each point of a light source as set forth in the claims.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are provided to further show the state of the art with respect to the structure of a display:

U.S. Patent No. 5,125,733 to Lee;

U.S. Patent No. 6,416,181 to Kessler et al.;

U.S. Patent No. 5,993,003 to McLaughlin;

U.S. Patent No. 6,040,946 to Hebert;

U.S. Patent No. 4,277,137 to Upatnieks et al.;

U.S. Patent No. 6,329,963 to Chiabrera et al.

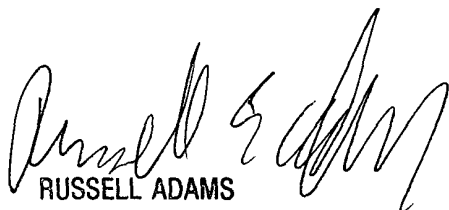
Art Unit: 2851

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Nguyen whose telephone number is 703-305-2771. The examiner can normally be reached on M-F 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russ Adams can be reached on 703-308-2847. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4900.

mpn
November 12, 2002


RUSSELL ADAMS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800